

PORTABLE DATA CARRIER INCORPORATING MANUALLY PRESETTABLE PROCESSING MODES

This is a continuation of application Ser. No. 030,274, filed Mar. 23, 1987, now abandoned, which is a continuation of application Ser. No. 343,829, filed July 6, 1982, now abandoned.

This invention relates to improvements in portable self-contained data carrying components which can be used for bi-directional communication via an associable data terminal with a calculator or location encoder terminal, and which data carrier is capable of performing at least a portion of the required data processing function within its own miniaturized circuitry.

The present paper is a continuation of the authors' earlier work as manifested in British Patent No. 1,314,021, B.P. Applications No. 7931208 7911393, 8010709, U.S. Pat. Nos. 3,870,866 and 3,906,460 to some of which reference will have to be made in the course of the detail description. Also other attempts have become known to create personal information bearer; it is noteworthy that the general trend is restricted to the aim of making already existing bank cards more secure and of obliging the general public to observe the constraints placed upon their proper use. To this comes the additional aim of avoiding on-line contact from the bank or point of sale terminal with a central computer installation because of the considerable cost of dedicated data lines.

The object of this invention includes but is not limited to the named improvements; not the replacement of one bank card by another is the main objective but the replacement of money in a large number of situations where this implies inconvenience as well as administrative inefficiency, often rightout harmful or costly bottlenecks in the delivery of services and facilities. The purpose of this invention is therefore the creation of devices which, on the one hand, can be handled as conveniently and rapidly as a coin in the pocket, on the other hand become a link at the disposal of the individual in a network of electronic fund transfer communication lines.

While thus the field of 'small cash transaction' is in the foreground, the technique to be developed must also fully meet the requirements of a bank card for medium and even large purchases. The comprehensiveness of these objectives brings problems since it is wellknown in the art that a valuable card can be protected against misuse by finders in the event of loss only by certain preparatory action required to be performed by the card user before the card functions. This is the keying in of a secret personal number which is checked against the true record of that number in the card itself.

Such a process takes time, there may be more people in a queue using the same terminal. Someone wishing to pay, say, 47 p in coins would resent having to spend any time whatever on dialling a personal number. Speed and Security appear thus as contradicting requirements. One of the purposes of this invention is to overcome this matter. Another problem is that many people have several accounts which they use dependent on circumstances. In some cases Giro is best, in others one of the large Clearing Banks, in still others a local Bank, and, where cash flow suggests a credit card account is often used. All these accounts should benefit from electronic fund transfer technology but it would be too expensive

to produce a separate 'electronic coin' for each of them. This leads to the concept of a "multi-mode electronic fund transfer purse". Just as a purse has several compartments meant for coinage, bank notes, credit cards and cheques, so the proposed on-person pay device would be adaptable to give out or receive value data at one time from/into a selected bank account, at another time from/into a credit account, and for all rapid small cash transactions from a money store. In addition, the device should perform checking and calculating duties in situations where small cash payments are frequent such as in supermarkets, in the use of taxis and public transport, and in many access control requirements where payment for access, or the time lapse of the period within the paid area, also occurs (See for example Br. P. No. 857,658 or U.S. Pat. No. 3,609,300 and U.S. Pat. No. 3,870,866). Parallel with the described requirements goes the need to be able to call forth on a display window, preferably away from any terminal, the status in any of the memory sections. In its general form, new solutions are offered and described in the copending British patent application Ser. No. 8028824. The techniques hereunder described constitute special embodiments which, among others, illustrate the possibility of producing a very compact personal data carrier such as could be carried about on a key ring together with standard Yale or similar keys.

The explanation of the invention principles is aided by examples which are illustrated in drawings 1-9 wherein

FIGS. 1A and 1B combined represent a diagram of a portion of the integrated circuitry in the data carrying component

FIGS. 2 and 3 are views of a particular realisation of the data carrying component

FIGS. 4 and 5 are views of a very similar data carrying component after incorporation of a display window and manual controls

FIG. 4a shows a holding pin,

FIG. 6 shows the electrical structure of the integrated circuitry capable of not merely fulfilling the functions associated with the manual selection buttons on the device but, all the functions of the component including for example those described in detail in our Patent Application Nos. 8004546 or 8028824.

FIG. 7 shows an alternative layout of a mode-controllable data token

FIGS. 8 and 9 show an example of a Read/Write data transfer terminal intended for rapid presentation, especially in access and revenue control situations and at turnstile controlled passage points.

The display window shown in FIG. 4, item 80, can also be seen in the diagram FIG. 1A, item 15; equally, the push buttons C, R, T and D can be seen in the said diagram, FIGS. 1A, 1B.

The function of the control button R is to reset all temporary stores. By depressing button C the Oscillator 1 receives operating voltage from the battery which is encapsulated in the component (FIGS. 2 or 4).

In consequence 80 c/s pulses pass through gate 7 which can only work when the device is in its PS-O condition (program step O, see patent appl. No. 8028824). Applied to a divide by 64 counter the output provides for one clock pulse every $\frac{3}{4}$ seconds which passes through OR gate 11a to a BCD counter 9 which applies the 4-line output to an 4-7 encoder 14. The ripple counter 10 has five output lines which act as enable inputs to the 5 latchable 4 to 7 encoder circuits